HANDBOOK

FOR THE

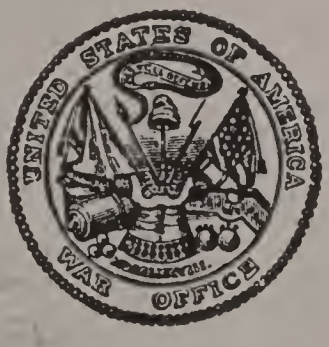
LONGUE-VUE BINOCULAIRE À PRISMES

(STEREOSCOPIC TELESCOPE)

(CAMPAGNE—MODÈLE 1917)

(NOTES ON THE PRISMATIC BINOCULAR TELESCOPE, MODEL 1917).

Prepared by the American Expeditionary Forces.



Army War College
February, 1918.

War Department
Document No. 759
Office of the Adjutant General.

WAR DEPARTMENT,
WASHINGTON, February 25, 1918.

The following notes on the "Prismatic Binocular Telescope, Model 1917," which have been adopted by the American Expeditionary Forces as standard, are published for the information and guidance of all concerned.

(062.1. A. G. O.)

By order of the Secretary of War,

JOHN BIDDLE,
Major General, Acting Chief of Staff.

Official:

H. P. McCAIN,
The Adjutant General.

TABLE OF CONTENTS

HANDBOOK

FOR THE

LONGUE-VUE BINOCULAIRE À PRISMES

(CAMPAGNE – MODÈLE 1917)

GENERAL DESCRIPTION.

The "longue-vue binoculaire à prismes" (stereoscopic telescope) is specially intended for the observation of targets and for the direction and control of fire. It is particulatly suited for observation at small and meduim ranges.

The "Campagne modèle 1917" is used with batteries provided with sights graduated in mils (6400 mils = 360 degrees), namely, the following: 75 m/m. guns, 65 m/m. mountain guns, 14 and 145 L. modèle 1916, 155 L. modèle 1877-1914 and modèle 1917 SCHNEIDER 155 C. modèle 1915 SCHNEIDER, 220 m/m. SCHNEIDER howitzer, etc.

The principal features of the instrument are as follows:

1° The telescope can be used in either of the two positions shown in fig. 1 and 2; in the latter the ratio between the distance between object glasses and the inter-ocular distance is as much as 10.6 (for an observer whose inter-pupillary distance is 65 m/m.) and consequently the relief-effect is considerably increased.

2° The magnification is 12; the illumination is greater than that of the 1909 pattern prism binocular and enables use of the telescope in conditions of low visibility.

3° The right-hand side telescope is fitted with a micrometer (fig. 4) which can be adjusted as desired by turning a milled ring.

4° The telescope is mounted upon an elevation movement D carrying a sight clinometer C; it is used on a stand fitted with an azimuth movement (see fig. 1, 2 and 3).

The **sight clinometer** enables the measurement of angles of sight in mils (6400 mils = 360 degrees.

The **azimuth movement** comprises two dials—an upper dial, carrying elevation movement and telescope which can be moved over a lower dial by turning milled head T of a tangent screw. Without upsetting the relative positions of upper and lower dials the whole instrument can be rotated by turning milled head S of lower tangent screw.

There are two graduations:

(1) On the lower dial a continuous clockwise graduation (1) from 0 to 6400 mils, used in conjunction with black index on upper dial. Each division is worth 100 mils and intermediate values are read on the left-hand side graduation of the tangent screw drum. Each graduation of the drum graduation is worth 1 mil, and it is read in conjunction with the black index mark (the one engraved on smooth ground).

(2) A second graduation on upper dial; this, in conjunction with the right-hand side graduation on tangent screw drum being intended for use specially with 75 m/m. and 65 m/m. mountain batteries when angles are measured in terms of "plateau" and "tambour" of the gun-sight. (See Annexe).

INSTRUCTIONS FOR USE

§ 1.—Setting up—Observation of Terrain.

To set up the instrument.—Remove stand and azimuth movement from their case (see that clamp C is tight). Loosen clamps of tripod legs and adjust sliding portions to desired height; press each leg well into the ground. Free the ball-and-socket joint R of the tripod by turning clamping nut G in counter-clockwise direction and bring the bubble to the centre of the spherical level H; then clamp ball-and-socket joint by turning nut G in clockwise direction.

Remove the telescope from its case. The elevation movement D will be found folded against the left-hand side body; without attempting to move it from this position fit it onto the pivot of azimuth movement (see that spur on azimuth movement engages with slot on elevation movement). Clamp elevation movement on azimuth movement by means of lever L.

Loosen, if necessary, the hinge-clamp S of the telescope and place the body-tubes either in the "periscopic position" (fig. 1) or in the "stereoscopic position" (fig. 2).

Tighten hinge clamp S and fit the ray shades over the object glasses and, if necessary, the yellow glasses over the eye-pieces. Adjust for focus and inter-ocular distance, as below:

To focus the instrument.—Each eye-piece is focussed separately. To focus, for example, the right-hand side telescope shut the left eye and observe a distant object with the right eye; turn milled collar until the definition is at its best. The graduations marked on eye-pieces are in dioptries

To adjust for inter-ocular distance.—Both eye-pieces having been focussed, proceed as follows in order to adjust for inter-ocular distance: Direct the telescope on a uniformly illuminated surface by turning milled head P of elevation movement; loosen the hinge-

(1) Corresponding to the graduation of gun sights with 75 m/m. guns, 65 m/m. mountain guns and the Schneider materiel mentioned on page 5. It should be noted that in the Schneider gun sights the index is fixed and the graduation movable, whereas in the 75 m/m. gun sight the "plateau" is fixed and the index movable. But in both cases **an increase in deflection is left deflection.**

clamp S; grasp body-tubes with the two hands and adjust the distance apart until the two fields are superposed. Tighten hinge-clamp S.

Scales in millimeters enable the observer to note the inter-ocular distance best suited for his eyes—in either the periscopic or the stereoscopic positions.

To lay on a determined point without making angular measurements.—Loosen clamp C fixing azimuth movement to stand. The telescope can then be turned freely in a horizontal plane. Elevate or depress as required by milled head P.

§ 2.—Preparatory Operations.

To measure an angle of sight (in mils).—Slacken clamp C and lay roughly for direction; tighten clamp C and adjust accurately by milled head S. Bring the centre of the cross of the micrometer on the target by means of elevation movement P.

Turn the clinometer on the telescope hinge until a "catch" is felt; bring the bubble of the clinometer level in the centre of its run by turning milled head U.

Read the angle in hundred of mils on the divided sector V (placed at the side of the clinometer) and the intermediate values on the drum Z. Black figuring corresponds to positive angles of sight, red figuring to negative angles. The black and red figures of the drum Z correspond to the figures of same color on the sector V.

To measure the horizontal angle between two points (in mils).—If the two points come at the same time in the field of the telescope make use of the horizontal scale of the micrometer (see fig. 4) each division of which is worth 5 mils.

In the other case proceed as follows—set the azimuth movement to zero by turning milled head T so that the zero on the lower dial coincides with index X on upper dial and the zero of the tangent screw drum coincides with index Y. Lay roughly on the left-hand side point by loosening clamp C, tighten clamp C and lay accurately by turning milled head S of general movement. Now lay on the right-hand side point by turning milled head T of relative movement (1). Read angle measured on lower graduation and tangent screw drum (indexes X and Y respectively).

To measure deflection for a given target.—Set the azimuth movement to zero and lay on target, then lay on aiming point by turning milled head T. Read off deflection—this can be expressed either as a true angle as indicated on continuous graduation (0—6400 mils—see paragraph headed (To measure the horizontal angle between two points) or in terms of "plateau" and "tambour" (see Annexe).

To lay a gun parallel to a given direction (by reciprocal observations).—1° Using gun-sights with graduation divided into 4 quad-

(1) When it is desired to measure an angle of several hundred mils it is quicker to throw tangent screw out of action by pressing pallet W right down. The upper dial will then turn freely over the lower dial. Before using slow motion see that the screw has properly engaged—but do not attempt to force it home—turn milled head T and screw will soon fill into gear.

rants and with "zero position" at 100 mils. (75 m/m. and 65 m/m mountain batteries). Station instrument about 50 metres from gun and lay it in the given direction (target or expected direction of fire) by using clamp C and milled head S, the instrument being set to zero. Now lay instrument on gun-sight pillar and read in terms of "plateau" and "tambour" the deflection which must be given to the gun (see Annexe). Lay the gun with this deflection on the centre of the instrument.

2° Using gun-sights with continuous graduations divided in 6400 mils with zero position at 0 mils. Station instrument about 50 metres from gun; set the instrument at 3200 mils and lay in the given direction by using clamp C and milled head S. Now lay instrument on gun-sight pillar using milled head T; read off the angle as indicated by continuous graduation. Lay the gun with this deflection on the centre of the instrument.

3° Using gun-sights with graduation in two halves divided in 3200 mils in the same direction and with zero position at 1000 mils. Station instrument about 50 metres from gun; set the instrument at 4200 mils and lay in the given direction, using clamp C and milled head S. Now lay instrument on gun-sight pillar using milled head T; read off the angle as indicated by instrument. Subtract 3200 if the reading obtained is greater than or equal to 3200. Lay the gun with this deflection on the centre of the instrument.

§ 3.—Direction and Control of Fire.

To determine the height of burst (in mils).—Make use of the vertical scale of the micrometer—divided every 5 mils. The distance between the dotted line and the zero graticule represents 3 mils and is equal to height of the top of the cross above centre lines—this angle is the "hauteur type" (the normal height of burst) for 75 m/m. guns.

Correction of deflection.—The instrument being laid in direction of target, bring the point of burst onto the vertical graticule of micrometer by turning milled head T. The deflection of gun must be increased (or diminished) by the angle by which the instrument reading has increased (or diminished).

Change of target.—The instrument being laid on the old target, direct telescope on the new target turning milled head T. The deflection of the gun must be increased (diminished) by the angle by which the instrument reading has diminished (increased).

TRANSPORTATION.

To put the instrument and tripod back in their cases.—Remove ray shades and yellow glasses, put these in the places provided for them in the case. Loosen clamp S and fold the two bodies to the left so that the elevation movement S comes into contact with the left body. Do not tighten up the clamp S. Separate telescope from azimuth movement after having pressed down the clamping lever L; turn the instrument round and put it in its case, object glasses first and turned towards the hinge of the case. Fasten in

the instrument by closing hinged front of case, close lid and fasten strap. The telescope in its case is carried on the back like a haversack.

To put the tripod and azimuth movement in their cases.—Fold up tripod and insert it in its case legs first so that feet are in contact with bottom of case. Close lid and do up fastening strap. The tripod in its case is carried across the shoulder.

UP-KEEP.

It is essential that the instrument should be very carefully handled so as to avoid shocks and falls. Cleaning of internal parts and dismounting of the dials or telescope are strictly forbidden. If necessary the instrument should be returned for repairs to the "Service Geographique de l'Armée". External parts only are to be cleaned. In cleaning a lens, never rub it with a cloth or anything which might grease or scratch the glass; breath on the surface and dry immediately by rubbing gently with a piece of fine dry linen which is not fluffy. Repeat this until the vapor condenses regularly and evaporates concentrically.

ACCESSORIES.

These include reinforced leather case with strap:

2 yellow moderating glasses in pockets of the case;

1 waterproof cloth case with leather lining, containing tripod and azimuth movement.

OPTICAL AND OTHER DATA.

Magnification	12
Real field about	67 mils
Dia. of exit pupil	4 mm. 25
Weight of telescope without case	4,8 to 5,4 kgs.
—— —— —— with case	7,3 to 7,9 kgs.
—— of tripod and azimuth in case movement	7,7 kgs.

ANNEXE.

TO READ DEFLECTION IN TERMS OF *PLATEAU* AND *TAMBOUR*.

When the stereoscopic telescope is used with 75 mm. batteries and set up close to the battery, by using the quadrant graduation on upper dial and the two indexes Y, W of the tangent screw drum the commands can be given in terms of "plateau" and "tambour".

"It should be noted that when the instrument is at zero, i. e., when index X is in line with zero division of lower graduation, the reading in terms of plateau and tambour is "plateau : 0", "tambour : 100".

To read in terms of "plateau".—One quadrant of upper dial is divided into 8 sectors marked P L 0, P L 2, etc., P. L. 14. As the optical axis of the telescope passes through the four quadrants of the "cercle fictif de pointage" (fig. 5) the quadrant on the upper dial passes successively over 4 arrow-shaped indexes which fall on the 0, 16, 32 and 48 marks of lower (continuous) graduation, whence the rule:

The "plateau" number is the number of the sector on which one of the indexes falls (1) (see example fig. 6).

To read in terms of "tambour."—Each sector of the divided quadrant comprises a smooth and a ruled portion. In reading in terms of "plateau", note in which of these two portions the index falls and read the tangent screw drum accordingly, i. e., use either reader Y on smooth ground or reader W on ruled ground (see example fig. 6).

(1) When laying a gun for direction by "reciprocal sighting" (page 7), the proximity of the gun renders the consideration of the quadrant useless; in this case, it will be seen that the indexes of the gun-sight and the telescope are necessarily brought into opposite quadrants.

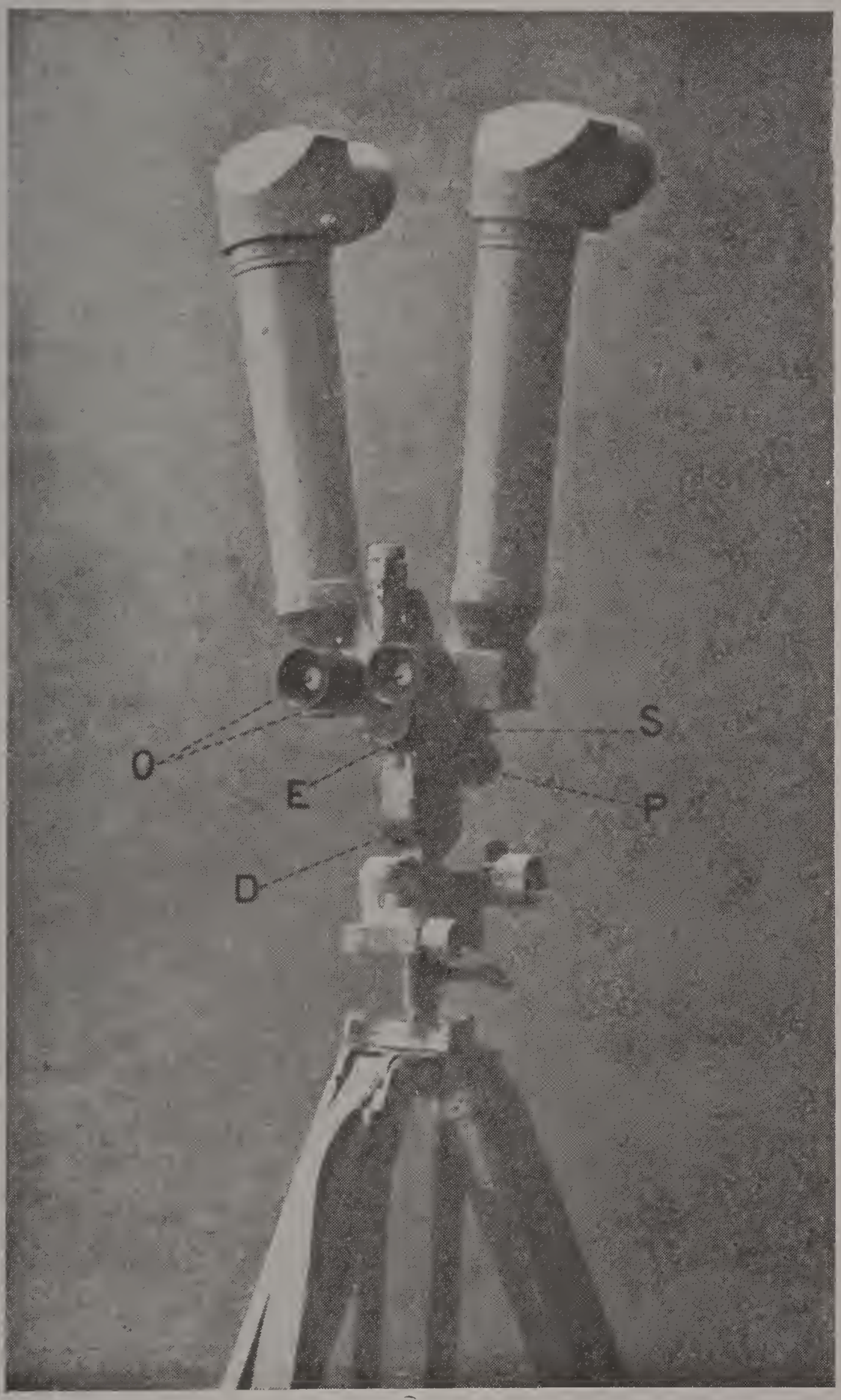


Fig. 1. — *Periscopic position.*

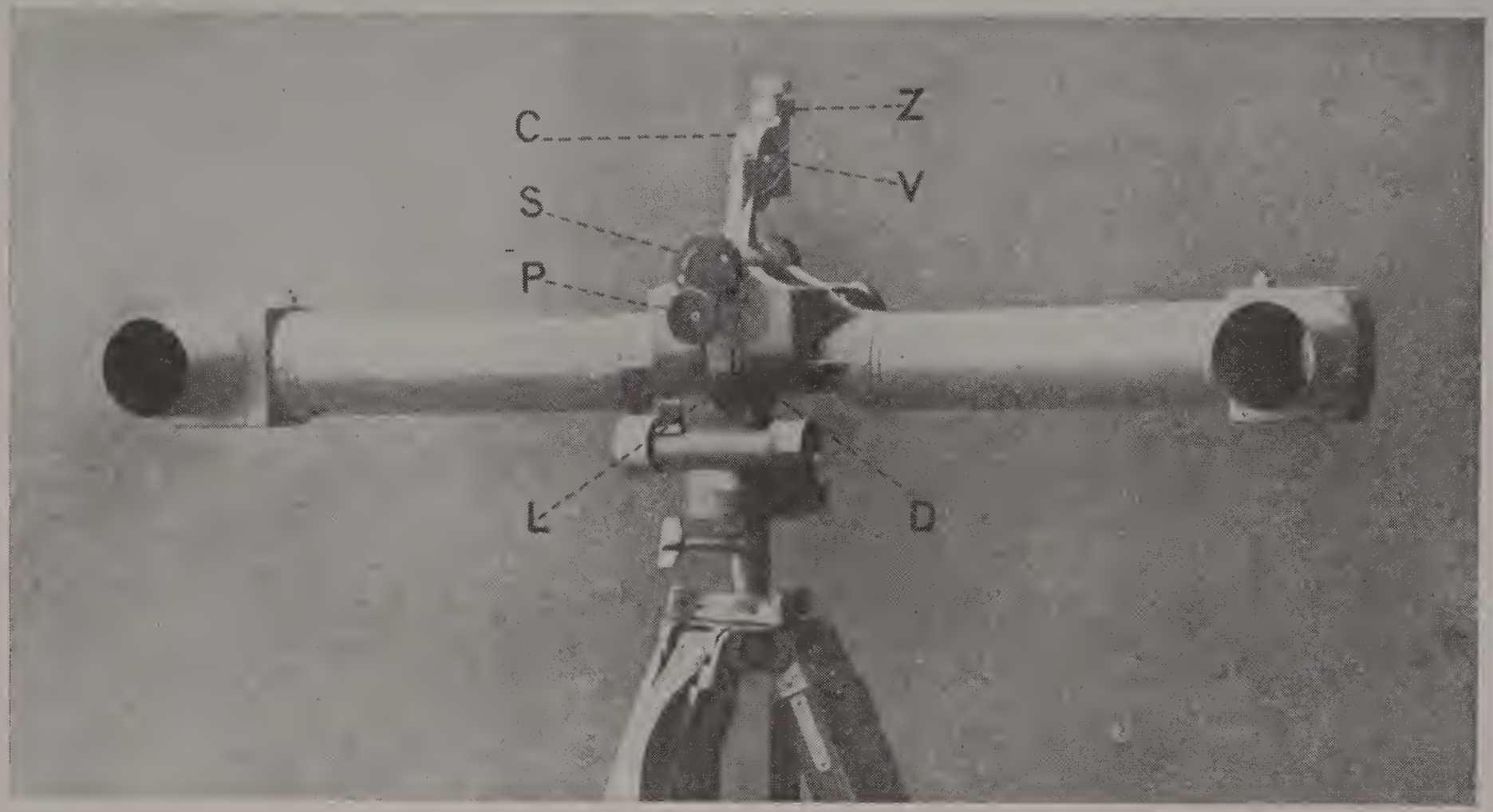


Fig. 2 — *Stereoscopic position*

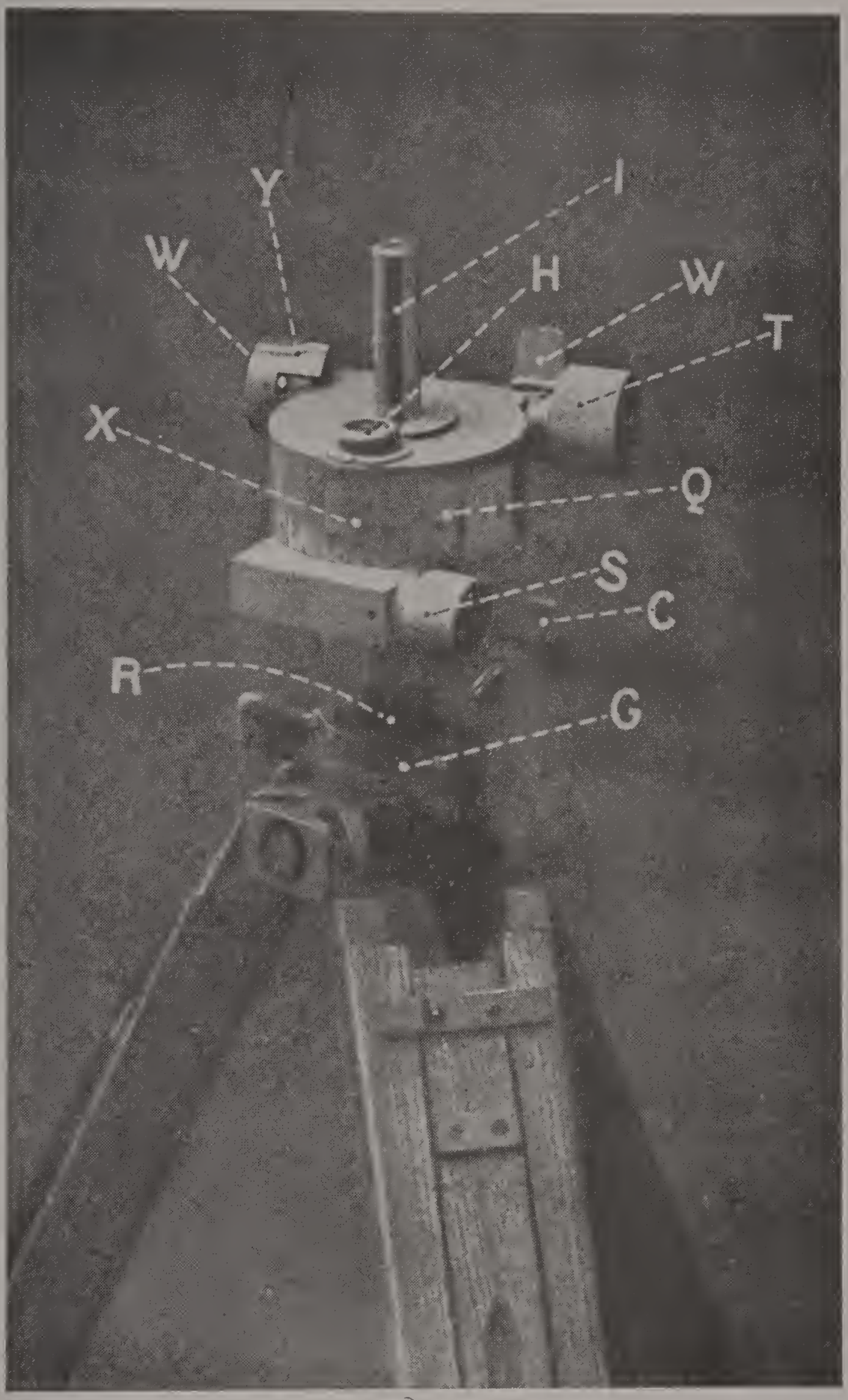


Fig. 3.

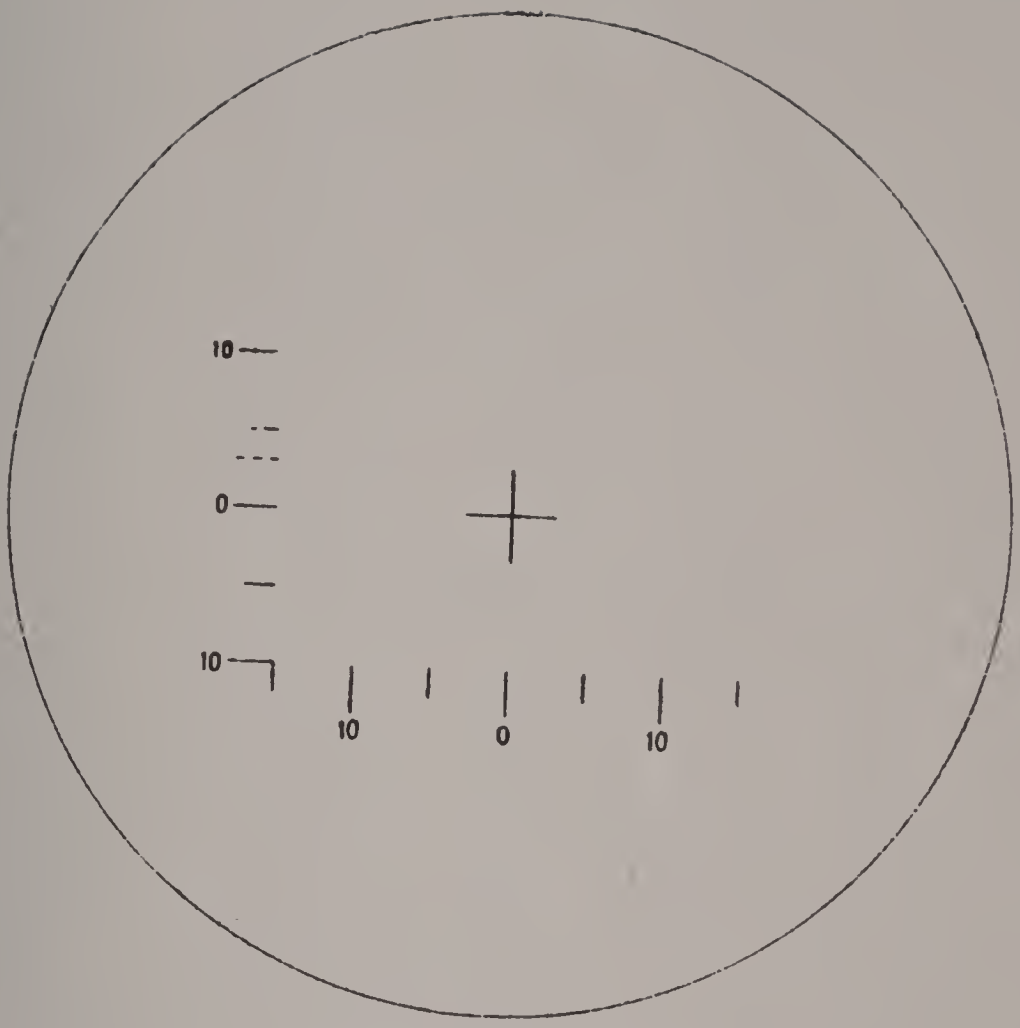


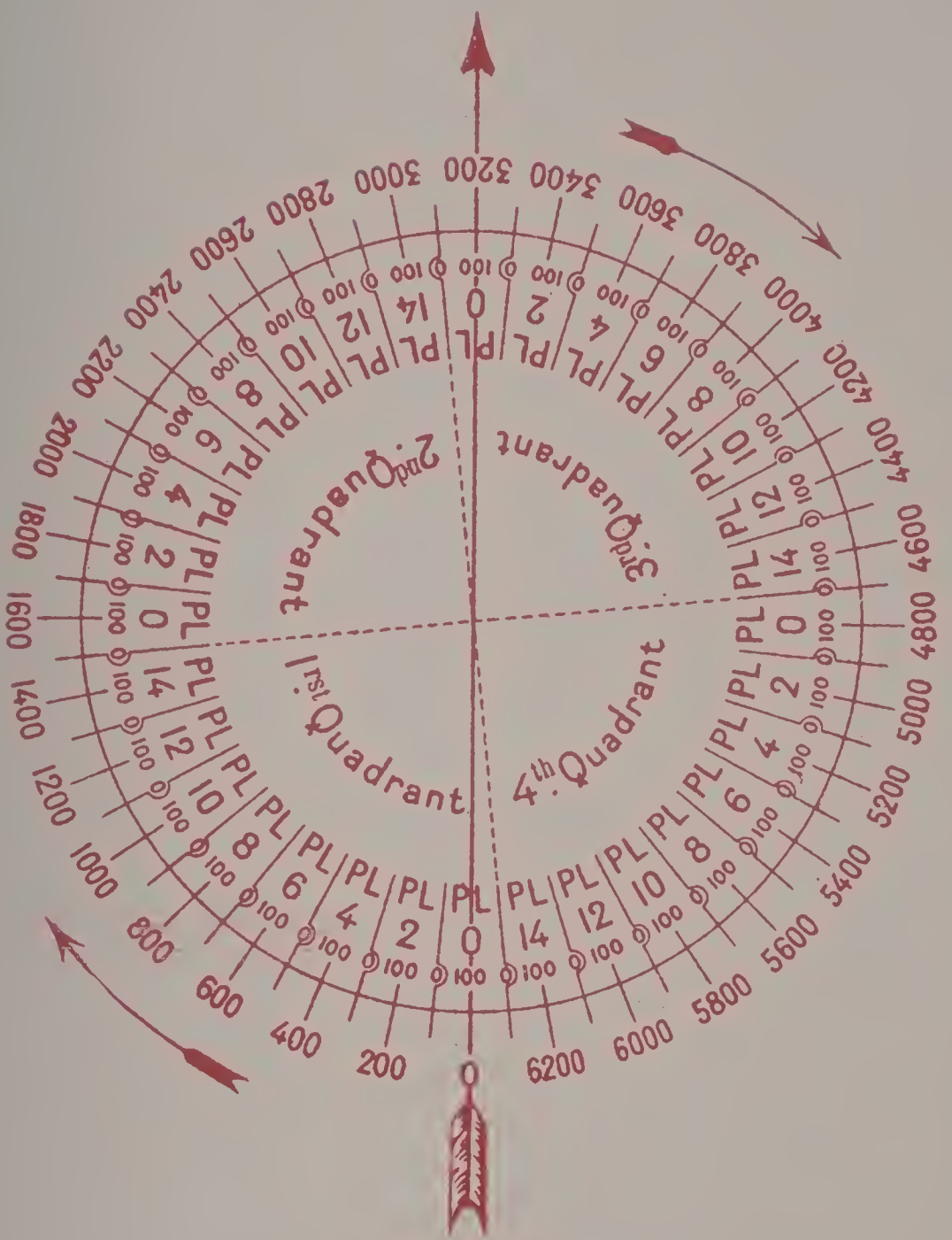
Figure 4. — *Micrometer.*

The center of the cross indicates the optical axis of the instrument.

Each division of vertical and horizontal scales is worth 5 mils.

The length of any arm of the cross is worth 3 mils. The top of the cross and the dotted line above the zero graticule facilitate the obtention of the normal height of burst of 3 mils, when the center of the cross coincides with the base of the target.

Figure 4.

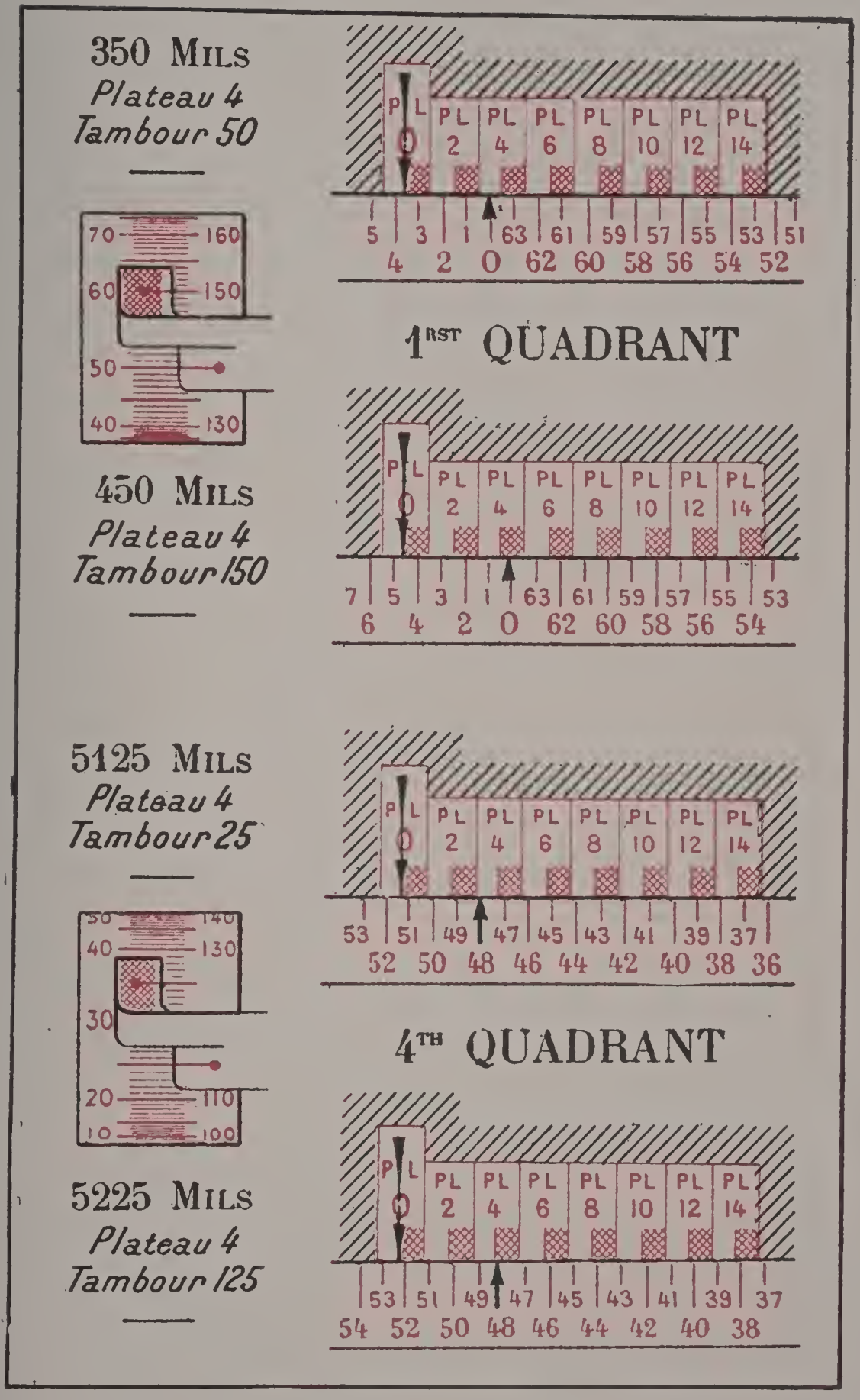


Plateau 0
Tambour 100

CERCLE FICTIF DE POINTAGE

(THEORETICAL SIGHT DIAL)

Figure 5.


350 Mils
Plateau 4
Tambour 50
70
160
60
150
50
40
130
PL 0
PL 2
PL 4
PL 6
PL 8
PL 10
PL 12
PL 14
5 3 1 63 61 59 57 55 53 51
4 2 0 62 60 58 56 54 52
1RST QUADRANT
450 Mils
Plateau 4
Tambour 150
7 5 3 1 63 61 59 57 55 53
6 4 2 0 62 60 58 56 54
5125 Mils
Plateau 4
Tambour 25
40
130
30
20
110
10
100
53 51 49 47 45 43 41 39 37
52 50 48 46 44 42 40 38 36
4TH QUADRANT
5225 Mils
Plateau 4
Tambour 125
53 51 49 47 45 43 41 39 37
54 52 50 48 46 44 42 40 38